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**PITFALLS OF TECHNOLOGY: A CASE STUDY OF THE BATTLE
ON TAKUR GHAR MOUNTAIN, AFGHANISTAN**

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MOUNTAIN, AFGHANISTAN**

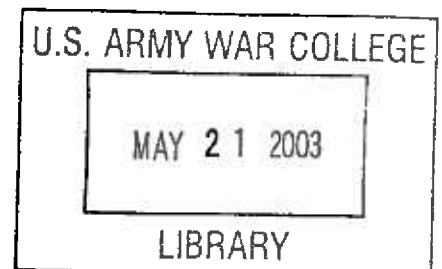
by

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ABSTRACT

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Themes:

The presence of some technologies contributed in a negative way to the events on Takur Ghar - one of the first battles on the 21st Century. Facing adaptable enemies, do we expect too much from our asymmetric edge in technology? Are we becoming over-reliant upon technology? Have we thoroughly vetted the limitations of our technologies?

Thesis

Fog and friction remain present in the face of technology. This paper will look at how a sequence of events, driven by decisions derived from advanced technological means - contributed to the loss of 7 US personnel. It will focus on three aspects of technology: *Imagery Intelligence and AC-130 optics*. A SEAL reconnaissance team's reliance on intelligence helped them achieve a level of comfort that caused them to violate one of the basic precepts of reconnaissance missions - never infiltrate directly onto an observation post. In this case, low tech defeated Hi-tech.

Infrared Strobe-lights. Simultaneous use of this relatively mature technology complicated efforts to grasp situational awareness after ABH1 Roberts' fall onto Takur Ghar.

Predator. Due to the availability of a Predator feed at the various Tactical Operations Centers, higher headquarters assumed they possessed better situational awareness than low-level commanders in closer proximity to the fight. What is seen on Predator in real time may be influenced by what you are predisposed to see.

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Preface.

*History is lived forward, but it is written in retrospect. We know the end before we consider the beginning and we can never wholly recapture what it was like to know the beginning only.*¹

—C.V. Wedgewood

The purpose of this research project was to address how technology may have in some instances played a detrimental role in battle and extrapolate the necessity for caution in how the U.S. military leverages technology in its quest for transformation. The first part of this paper highlights how technology actually contributed to the ambush of RAZOR 03 on Takur Ghar, and then made matters worse during the conduct and aftermath of the battle.

The author set out to capture a factual, historical chronology of the events of 3–4 March, 2002, at Takur Ghar mountain, Afghanistan*. The intention was to provide a level of certainty, where possible, for the actions of U.S. personnel in combat. This effort began in mid-March 2002 with interviews with personnel at Masirah Island, Oman, and at Kandahar and Bagram, Afghanistan. At these locations were the participants from the Joint Special Operations Task Force (JSOTF), Team RECCE, Task Force (TF) SEAL, TF RANGER, 2-160 SOAR(A), Combined Joint Task Force (CJTF) MOUNTAIN, and the Chief of the Bagram medical facility. The author climbed Takur Ghar mountain with the MAKO 30 Reconnaissance (recce) team leader on 25 March and participated in the interrogation of a prisoner thought to have been in the vicinity of Takur Ghar during the battle. Upon returning to the United States, the author interviewed personnel and participated in an after action review at 2-160 Special Operations Aviation Regiment (SOAR) at Fort Campbell, KY, and spoke with the commander of TF SEAL, in Norfolk, VA. In addition, the author processed forensic evidence with the FBI Headquarters and the Armed Forces Institute of Pathology, in Washington, DC, and interviewed most of the participants in this battle.² This paper has resulted from a compilation of participant statements, intelligence reports, operational graphics, Joint Operations Center (JOC) logs, video streams, photographs, forensic reports, and a physical exploitation of what remained on Takur Ghar after the battle.³ It does not attempt to capture unit lessons learned, as they have been, and continue to be, documented at the unit level.

As one of the first battles of the Twenty-first century, the story of Takur Ghar represents a harbinger, characteristic of future U.S. military operations: it was a joint battle with special operating forces (SOF) supporting a larger conventional operation (ANACONDA). It involved

* Takur Ghar mountain, Afghanistan. UTM coordinates WB 42S 200895.

the use of cutting-edge technology. The battle itself was a story of courage and sacrifice, one in which seven Americans died fighting for their country – and for each other. It is also a Joint Service story. Service members from the Army, Navy, and the Air Force lost their lives in this one battle. This account will hopefully provide a better sense of understanding of the dual-edged nature of technology and the contributions of individuals and units in the battle. It is important to note that every U.S. commander made what they truly felt was the best decision they could, given the information they had at the time.⁴ One must always remember how little one can recover from the harsh world of the combat actions of others:

If a critic wishes to praise or blame any specific action, he will only partly be able to put himself in the situation of the participant... The critic will always lack much of what was present in the mind of the commander. A critic should therefore not check a commander's solution to a problem as if it were a sum in arithmetic. To judge even the slightest act of talent, it is necessary for the critic to take a more comprehensive point of view, so that he, in possession of any number of objective reasons, reduces subjectivity to the minimum, and avoids judging by his own, possibly limited, standards. More often the critic does not mean to be arrogant; but, unless he makes a point of denying it, a hasty reader will suspect him of it, and this will at once give rise to a charge of lack of critical judgement.⁵

—Carl von Clausewitz, *On War*

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Pitfalls Of Technology:

A Case Study Of The Battle On Takur Ghar Mountain, Afghanistan

In December 2001, a Joint Special Operations Task Force (JSOTF) deployed to Afghanistan to execute a specific mission -- to capture or kill Taliban and Al-Qaeda (AQ) leadership, or as they had come to be known, high value targets. The JSOTF began its combat operations throughout Afghanistan. It quickly achieved a clear sense of the pockets of enemy activity. By February 2002, however, the JSOTF had become frustrated by the lack of actionable intelligence for high value targets. It knew there was a large concentration of Taliban and Al-Qaeda in the Shah-e-kot valley, but what its members did not know was whether there were any high value targets amongst the enemy forces. Lacking the forces to conduct a large-scale operation themselves, the JSOTF recognized the potential to leverage forces from the Combined Joint Task Force (CJTF) MOUNTAIN to produce complementary efforts. CJTF MOUNTAIN was the headquarters element of the 10th Mountain Division which commanded an assortment of combat and combat support units from the 101st Airborne Division (Air Assault) and its own units. CJTF MOUNTAIN, and its parent headquarters in Kuwait, the Combined Forces Land Component Commander (CFLCC), both focused on the broader mission of eliminating the remnants of Taliban and Al-Qaeda forces. In early February, JSOTF intelligence planners met with counterparts from CJTF MOUNTAIN, CFLCC, and other organizations to develop a common approach to flushing the enemy and potential high value targets out of the Shah-e-Kot sanctuary. This vision became the seed that eventually bore fruit in a major operation.

CJTF MOUNTAIN, commanded by Major General Franklin L. "Buster" Hagenback, conceived a classic military "hammer and anvil" maneuver—code-named Operation ANACONDA. U.S. and Afghan Military Forces in Gardez would push from the west to clear the western portions of the Shah-e-Kot valley of Al-Qaeda. ANACONDA planners believed this maneuver would cause the enemy to flee east into blocking positions of awaiting American soldiers from the 10th Mountain and 101st Airborne Divisions in the eastern sections of the valley. Augmenting conventional forces would be small reconnaissance teams, drawn from United States and Coalition Special Operations Forces. These teams would include U.S. Navy SEALs, Army Special Forces, and Air Force special tactics operators, among others. The plan was to position such reconnaissance teams at strategic locations, where they could establish

observation posts. These observation posts would then provide information on enemy movements and direct air strikes against Al-Qaeda forces fleeing eastward.

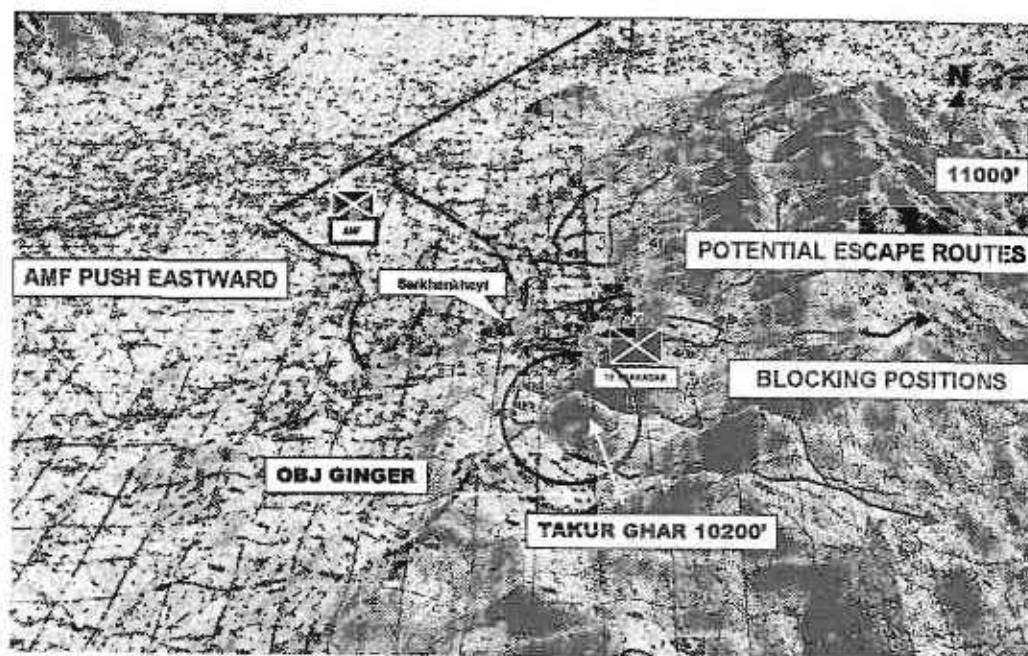


Figure 1. Operation ANACONDA Operational Area

Prior to development of the ANACONDA plan, the JSOTF had been coordinating operations with the Combined Forces Land Component Commander and General Hagenback to reduce the chances of fratricide. Significantly, it enjoyed a direct command relationship with Central Command and was not a subordinate element of CFLCC or of CJTF MOUNTAIN. Although the sharing of battlespace and the unorthodox command relationships created some friction, liaison officers, embedded in the various organizations, helped defuse potential conflicts. The collegial personalities of the commanders also insured unity of effort. When CJTF MOUNTAIN began planning ANACONDA, the JSOTF assumed a supporting role. Through its participation in the operation, it hoped to capture the high value targets that military action might flush out of hiding. The inherent special operations forces' skill sets made them ideal for use as reconnaissance teams. JSOTF teams had already been conducting reconnaissance missions elsewhere in Afghanistan. Figures 2 & 3 indicate the JSOTF sub-element missions and task organization.

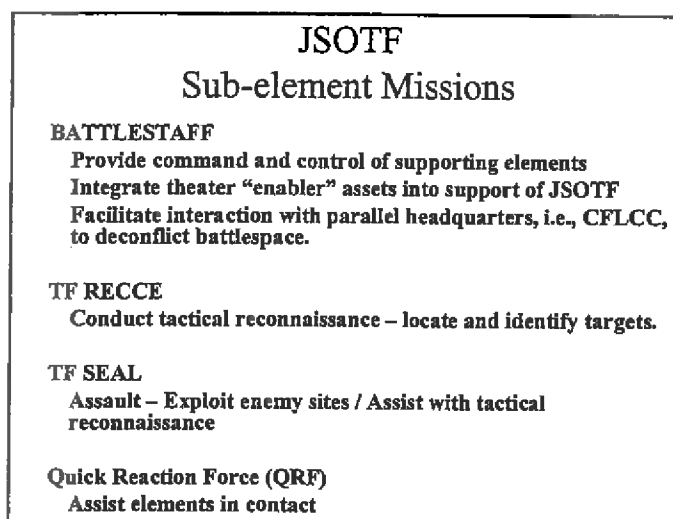


Figure 2. JSOTF Sub-element Missions

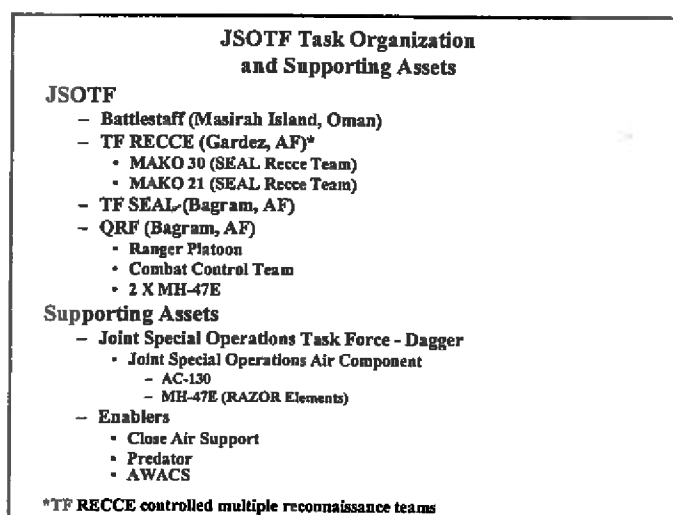


Figure 3. JSOTF and Supporting Assets

Operation ANACONDA began on 1 March, and, as is axiomatic in combat operations, things failed to go as planned right from the start. Rather than flee, disciplined and well-trained Al-Qaeda soldiers stood and fought. At times, they received reinforcements from a series of wadis and trails at the southern end of the valley near Marzak, dubbed the "rat-line." Heavy and sustained enemy resistance, coupled with an AC-130 friendly fire incident, halted the advance of Afghan military forces and caused a withdrawal to Gardez. Because of bad weather and unexpectedly heavy resistance, the 10th Mountain Division could insert only a portion of its

troops into their intended positions on D-Day. Those who did land, almost immediately found themselves under intense mortar and small arms fire.

Although things had not gone well for their conventional Army counterparts, the Special Forces teams, hidden in their observation posts, enjoyed considerable success in coordinating air attacks on enemy positions. This provided some relief to hard-pressed 10th Mountain Division troops, especially east of Marzak, at helicopter landing zone Ginger. General Hagenbeck then repositioned his troops to the northern end of the Shah-e-Kot valley and attacked the Al-Qaeda from that direction. As the battle became more fluid, he recognized the need to observe the southern tip of the valley and the "rat-line." Thus, he requested additional observation posts near landing zone Ginger for surveillance and to guide air strikes on Al-Qaeda concentrations. A 10,000-foot, snow-capped mountain, named Takur Ghar, appeared as the perfect location for such an observation post. That mountain dominated the southern approaches to the valley and offered excellent visibility into Marzak, two kilometers to its west. It also provided an unobstructed view of the "Whale," on the other side of the valley (Figure 4). The "Whale" was so designated, because it resembled a "whale's back" – and was similar to a well-known terrain feature at the National Training Center.

General Hagenback and the Joint Special Operations Task Force agreed that an observation post on Takur Ghar would be ideal to help in the unfolding fight. On 3 March, JSOTF quickly agreed to emplace an observation post on the mountain. Takur Ghar was a perfect site for an observation post, but unfortunately, the enemy thought so too.⁶ Unbeknownst to U.S. forces, the enemy had sited a well-concealed and fortified force, including a heavy machine gun bunker, on the mountain. The heavy machine gun itself was in an excellent position to shoot down coalition aircraft flying in the valley below. U.S. intelligence, surveillance, or reconnaissance (ISR) had identified none of these positions before the fight began.

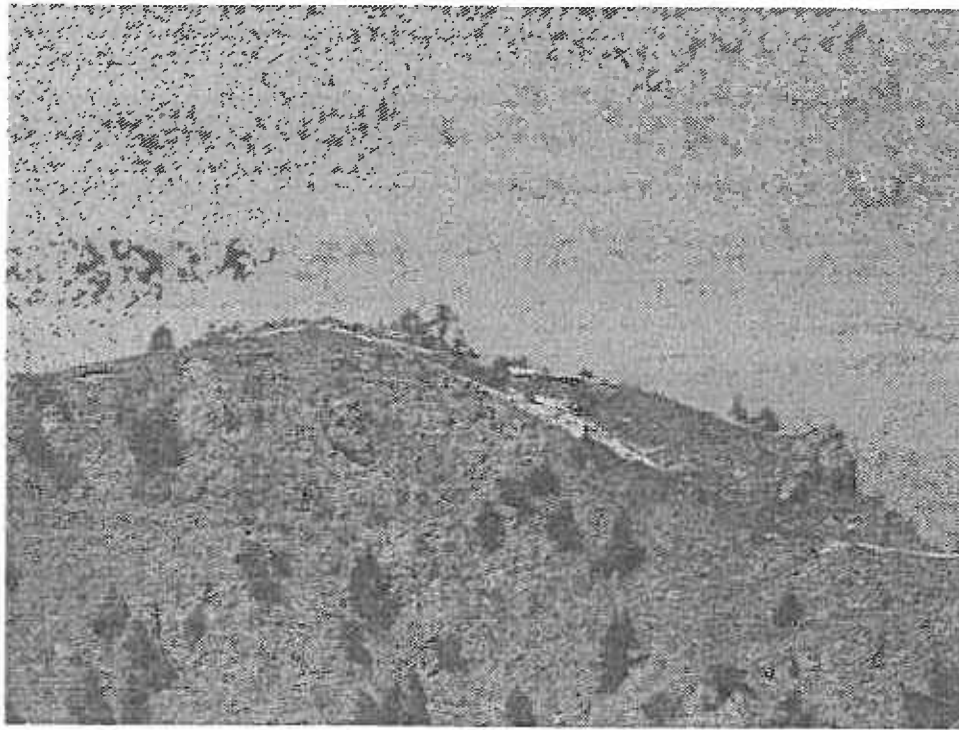


Figure 4. Takur Ghar Mountaintop, 5 March 2002

In the early morning hours of 4 March, 2002, Al-Qaeda soldiers fired on an MH-47E helicopter, inserting the reconnaissance element on Takur Ghar. As a result, a Navy SEAL, Petty Officer Neal Roberts, fell from the helicopter, beginning a chain of events that culminated in one of the war's most intense firefights. This action precipitated the death of a considerable number of Al-Qaeda occupying the mountaintop, and, sadly, the death of seven U.S. servicemen as well.

This paper analyzes the role played by several key technologies in this mission to emplace an observation post on Takur Ghar, and the actions that occurred after the mission went awry. It will suggest that some advanced technologies actually contributed to the ambush of the reconnaissance team and then made matters worse during the conduct of the ensuing firefights. The intent is two-fold: first, to demonstrate how technology, even when used exactly as designed, harbors hidden limitations; and second, to describe how those limitations may not appear until exposed to the actual conditions of combat and extrapolate the necessity for caution in how the U.S. military leverages technology in its quest for transformation.

To accomplish this, this paper will examine four aspects of the battle. The first was the failure of sophisticated imaging systems, both AC-130 optics and national-level assets, to discern the presence of enemy personnel and fortifications on Takur Ghar.⁷ The second was

how the simultaneous use of the infrared (IR) strobe-light by separate entities, actually produced confusion in the early stages of the initial rescue attempt. The third saw the perceived omniscience of the Predator Unmanned Aerial Vehicle result in a decision to take command and control away from the tactical commander. And finally, this paper will examine how viewing live Predator video can mislead, rather than inform commanders and staffs.

AC-130 Imaging Systems And Imagery Intelligence.

One of the pillars of the military's transformational efforts is the leveraging of hi-tech intelligence, surveillance, and reconnaissance (ISR) to provide requisite early warning and force protection. This section will highlight how the reliance on ISR actually contributed to the events on Takur Ghar.

On 2 March 2002, U.S. forces began planning to insert reconnaissance teams into two observation posts the following night. Two MH-47E Chinook helicopters, callsigns RAZOR 03 and RAZOR 04, were to fly the teams to their infiltration point. From there, the recce teams would move onto their intended observation posts. The two teams, MAKO 21 and MAKO 30, were elements of Task Force SEAL. While participating in ANACONDA, these teams were under the operational control of Task Force RECCE, which controlled all Joint Special Operations Task Force reconnaissance efforts supporting ANACONDA. MAKO 30 was a seven-man team consisting of six U.S. Navy SEALs and an Air Force combat controller. For this mission, RAZOR 04 would infiltrate MAKO 30, while RAZOR 03, would infiltrate MAKO 21.

In the early morning of 3 March, MAKO 21 and MAKO 30 departed Bagram to link-up with Task Force RECCE at Gardez. That town is approximately twenty miles west of the Shah-e-kot valley. Upon arrival at Gardez, the teams met with elements of Task Force RECCE and began planning their missions. MAKO 21 was to conduct a link-up with an established observation post northwest of the Shah-e-kot valley and watch the mountain passes eastward, while MAKO 30 was to establish an observation post on top of Takur Ghar. Intelligence indicated that Al-Qaeda forces were using the southern area to reinforce, and then escape the fight in the Shah-e-kot valley. An observation post on Takur Ghar mountain could control the entire southeast portion of the valley and help prevent Al-Qaeda forces from escaping. According to the MAKO 30 team leader:

...Prior to the mission, we studied photos of both our intended insertion helicopter landing zone and of Takur Ghar mountain. We also looked at other intelligence, surveillance, and reconnaissance reports. There were no significant indicators that the mountain was occupied. Insertion was planned for that evening at 1130pm local time (1900Z) with two MH-47Es. It was important to go in early enough in the evening to provide enough darkness for movement from our helicopter landing zone up the

mountain and into the observation post. We determined that it would be about a four-hour climb.⁸

During pre-mission planning, the MAKO teams determined that AC-130 coverage was an imperative for insertion. The AC-130 could provide immediate fire support and due to its excellent optics would serve as a useful tool for uncovering enemy forces. On the initial attempt at infiltration, air controllers pushed the AC-130s out of the operational area to de-conflict the airspace. The team leaders then elected to abort their infiltration until such time as the AC-130s could perform a visual scan of the landing zone. Later, after the AC-130 had performed its scan, it then moved away to support 101st Airborne troops in contact. Nevertheless, the MAKO team leaders elected to continue the insertion. This fact that the team was relying more on the AC-130's optics than on its ability to provide immediate and accurate fire support is consistent with the high regard with which the special operations community have held AC-130 optics.

The sensor suite on the AC-130U consists of television and infrared sensors, as well as radar. These sensors enable the gunship to identify friendly ground forces and enemy targets visually or electronically during the day or night and in virtually any weather conditions. The fact that the AC-130 did not detect the presence of enemy forces on Takur Ghar, despite footpaths in the snow and the snow-covered DShK (Soviet made 12.7mm Machinegun) gun pit (Figure 5), may represent an actual indicator of the AC-130's usefulness in that role. However, the AC-130 optical capability had become a *sine qua non* for insertion, at least in the team leader's mind. As one commentator has noted:

Clausewitz might have modified his negative attitude towards intelligence had he been granted some foresight about technological developments in information-gathering. It seems most probable, however, that he would have remained skeptical about the ability of technology to conquer friction. Periodic celebration of the concept of the fog of war can serve as a healthy corrective to those who are unduly credulous about the prospects for achieving total transparency over a battlespace of 40,000 square miles.⁹



Figure 5 - DShK Gun Pit on Takur Ghar

Late on the next evening, the two helicopters took off from their base at Bagram, picked up the recce teams in Gardez, and flew toward "the box" – as the ANACONDA operational area had become known to U.S. soldiers. Approximately six minutes from landing MAKO 21, the AC-130U (NAIL 21) informed the Air Mission Commander that it could not put eyes-on the infiltration landing zone – due to an ongoing air strike. NAIL 21 then had to exit the operational area until the strike was complete. Although the air strikes would not have impeded the MH-47E flight routes, the Air Mission Commander and MAKO team leaders decided to return to Gardez and await the end of the air strikes to enable an AC-130U scan of the landing areas.¹⁰

After completion of the B-52 strike, RAZOR 03 developed an engine problem during start-up. The Air Mission Commander immediately called for two replacement helicopters. To minimize the delay, he decided to substitute only the pilots, when the new helicopters arrived from Bagram. The crewchiefs remained with their aircraft. The delay would still be at least two hours.

The MAKO 30 team leader became concerned that he would not have sufficient darkness to walk from his insertion point to his observation post. (See figure 6). He radioed his parent headquarters, Task Force SEAL (instead of the TF RECCE commander), seeking a twenty-four-hour delay. As a result, the Task Force RECCE commander and the Joint Special Operations Task Force battlestaff, would not be party to MAKO 30's subsequent decisions. Later in the evening, this led to increased confusion within the JSOTF battlestaff. Although

neither approving nor denying the request, Task Force SEAL reminded the team leader of the observation post's significance to the overall ANACONDA operation. The team leader then asked the aircrew,* if it were possible to lift them closer to Takur Ghar. Based on a study of the imagery, the aircrew suggested that the only suitable landing zone was directly on top of the mountain – on the team's observation post.¹¹ Although inserting directly into an observation post violated a basic tenet of reconnaissance, the team leader and aircrew agreed that that was where they would go.¹² Having exhaustively studied the available imagery, the team was comfortable with the decision. They had seen nothing in the imagery, or intelligence, surveillance, and reconnaissance reports, that concerned them.

The MAKO 30 team leader knew he was violating a basic tenet, but chose to do so confident that the AC-130U would confirm the lack of enemy presence on Takur Ghar. The team had been employed on other missions and was confident in the ability to leverage the considerable resources of the Joint Special Operations Task Force. But there had been one too many successes.

Victory disease. In strategy, nothing fails like success, not only because enemies adapt to your methods, but because you become unduly persuaded of your genius or the favour of the gods.¹³

The helicopter crew passed the coordinates of the new landing zone to the AC-130U, NAIL 22, and asked them to look it over. NAIL 22 over-flew both MAKO 21 and 30's landing zones. Its fire control officer and navigator, using on-board sensors, scanned both areas. It then reported both locations secure.

The replacement helicopters arrived and the pilots briefed the new crews on the mission. The force departed Gardez at 0230. When the Air Mission Commander contacted NAIL 22 to provide new arrival times, he was informed that the AC-130 was now assisting other friendly troops in contact elsewhere. After a brief discussion with the team leaders, the Air Mission Commander decided to continue with the mission without AC-130 support. Ironically, earlier in the evening, the absence of the AC-130's scanning capability had caused the team not to execute the infiltration. However, later in the evening, after the AC-130 scan was complete, the

* The aircrew had been flying in the Afghan area of operations for almost five months. Initially, enemy threats were significant. However, by March 2002, the perception of the threat had waned considerably as the United States and its coalition partners had turned the tide and achieved great successes. The aircrews had become comfortable with the flight environment in Afghanistan. The recce team trusted their ability to determine the suitability of landing zones.

team elected to execute their infiltration even though the AC-130 would no longer be available to provide immediate fire support.

INSERT PLAN FOR MAKO 30

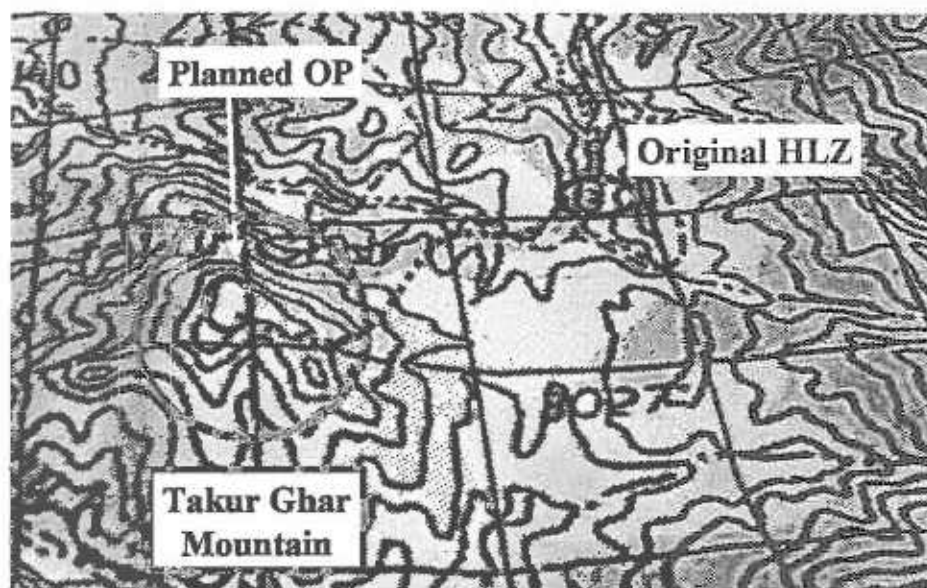


Figure 6. MAKO 30 Insertion/Movement Plan

At approximately 0300 (2230Z), RAZOR 03, carrying Roberts' team, approached the landing zone on a small saddle atop Takur Ghar. As the helicopter touched down, both the pilots and the men in the back observed fresh tracks in the snow, goatskins, and other signs of recent human activity, all of which the AC-130 had failed to detect. Immediately, the pilots and team discussed a mission abort. It was too late. A rocket propelled grenade (RPG) immediately struck the helicopter, while machinegun bullets ripped through the fuselage, cutting hydraulic and oil lines. Fluid spewed about the ramp area of the helicopter. Roberts was standing on the ramp, poised to exit, when the pilot applied full power to get off the landing zone. This sudden movement immediately jolted Roberts and a crewchief off balance. As they reached to steady each other, both slipped on the oil-soaked ramp and fell out of the helicopter. Only the crewchief was wearing a safety harness. Meanwhile, the pilots fought to regain control, as other crewmembers pulled the tethered crewchief back into the aircraft. Un-tethered, Roberts fell approximately 5-10 feet onto the snowy mountaintop. The MH-47E aircraft commander describes the ensuing events:

... an RPG hit the left side of the aircraft. It hit the left electrical compartment and went through the left ammo can, wounding the left side gunner before it exited the other side of the aircraft and exploded. (Figure 7) We immediately lost all AC electrical power. A second RPG hit the multi-mode radar (MMR) pod. The loss of AC electrical power rendered the M134 mini-guns inoperative. We also lost our multi-function displays (MFD), Navigation systems, Automatic Flight Control Systems, radios, and other systems. The only things still functioning were our battery powered night vision goggles (NVG) and the DC battery powered inter-crew communication system (ICS). We thought another RPG hit the right electrical compartment. Small arms fire ripped through the right ramp area in the vicinity of the flare dispenser. The SEAL team stayed on the aircraft and told us to lift off the landing zone. The crew shouted "Ready rear, go, go, go, lift off!" I took control of the aircraft from my co-pilot and quickly took off. The sudden increase in takeoff thrust caused a rotor droop so I slightly lowered the thrust to regain rotor RPM. The takeoff momentum carried us forward off the mountain where I began an autorotation to the valley below. The aircraft was shaking in an abnormal manner and the flight control feel was "heavy", with some feedback. I began a turn to the north in an attempt to make it to a secure landing area. It was then that the crew informed me that we had left a SEAL on the landing zone. I started turning back toward the mountain and told the crew to get prepared to go back in. The crew reminded me that the miniguns were inoperative. As soon as I began to turn, the controls became more difficult to move. The hydraulic system had apparently been damaged too, so I aborted the rescue in order to save the aircraft. Forgetting that the radios were inoperative, I asked the air mission commander, sitting in the jump seat, to call our sister ship to effect the rescue. No joy. A crewchief began servicing the hydraulic fill module and the flight control responses improved. I elected to try a landing at MAKO 21's landing zone, fixing our position by landmarks (we were in the vicinity of the infamous "whale"). The controls were responding and I started a descent for landing. My co-pilot started the Auxiliary Power Unit in an attempt to regain electrical power – without success. Using a flashlight, he then turned his attention to calling out airspeed and vertical speed from the backup attitude indicator. The flight controls would occasionally pull to the right, but as more fluid was added, control response would improve. It became apparent that if we were to survive, I had to put the aircraft on the ground as soon as possible. I could not safely lose enough altitude to land at MAKO 21's landing zone. My co-pilot backed me up on the controls during the approach and, to assist in our landing, the crew began calling our incremental altitude heights. I set the aircraft up in what I considered to be a suitable landing attitude and lowered the thrust. At approximately ten feet, I could not move the cyclic stick. The aircraft settled quickly into the ground. We had flown approximately seven kilometers from the top of the mountain.¹⁴

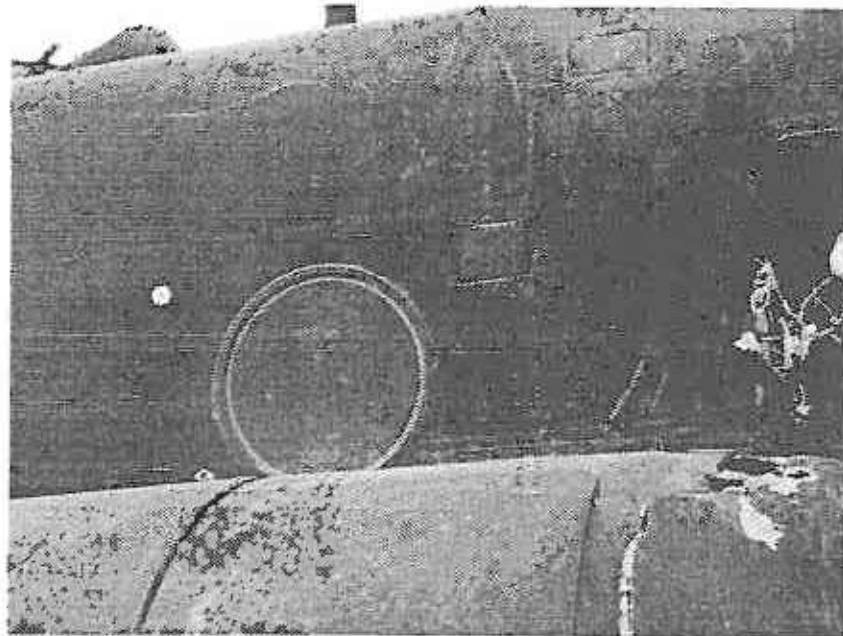


Figure 7. RAZOR 03 RPG Damage

At the initial landing site, the enemy had constructed his bunkers under the foliage and at the base of the trees – all covered with three feet of snow. (Figure 8). He had strung his command and control (C2) tent between a rock crevice, so that it appeared as a shadow on overhead photographs. (Figure 9) Snow blanketed the entire mountaintop, including the anti-aircraft (DSHK) bunker. Thus, his low-tech concealment countermeasures had defeated the best of U.S. high-tech surveillance methods. The AC-130 and the multi-source imagery and intelligence, surveillance, and reconnaissance had failed to detect any signs of human presence on top of Takur Ghar. Unquestionably, MAKO 30's decision to insert directly to the observation post had resulted from their trust in the imagery products and the imaging sensors on the AC-130. Coupled with the AC-130's confirmation that the mountaintop was clear, MAKO 30's confidence level was such that it caused him to violate a basic tenet of reconnaissance – never infiltrate directly into an observation post.

Significantly, MAKO 30 would not have been so overconfident had there been no imagery or AC-130 optics. This was clearly a case where the users viewed the technologies as nearly infallible. The result led to overconfidence and an underestimation of the enemy's ability to adapt to U.S. intelligence, surveillance, and reconnaissance capabilities. Again to quote Clausewitz: *...By intelligence we mean every sort of information about the enemy and his country – the basis, in short, of our own plans and operations. If we consider the actual basis of*

*this information, how unreliable and transient it is, we soon realize that war is a flimsy structure that can easily collapse and bury us in its ruins.*¹⁵

The team's decisions would likely have been different, had such technologies not been available. As the team leader commented: *"...it is incredulous that anyone would believe that we would have gone up to the mountain had our intelligence analysis indicated the presence of enemy personnel. We just didn't see it."*¹⁶ In fact, the decision to abort the original infiltration at the beginning of the evening had resulted from the AC-130's (NAIL 22) movement out of the area to facilitate a B-52 strike – not because of any conflict with RAZOR 03 or 04's flight routes. AC-130s require significant maneuvering space for their orbits. There was no conflict between the B-52 strikes and the helicopter flight routes. The helicopters were only six minutes from touchdown. Should they have continued on to their original landing zones? The reliance on the AC-130's optics [for assessing the landing zones] was paramount in the decision to abort the original infiltration. The entire evening's events would likely have been different had they continued on to their original landing zones. Granted, MAKO 30 would still have met the Al-Qaeda either en-route to, or on, Takur Ghar. However the team would have done so under different terms. Its climb up the mountain would have more resembled a tactical meeting engagement. In this case, the team would have been in a position to employ the enabling assets available – much as other reconnaissance teams had done throughout ANACONDA. In every other instance of inadvertent contact with enemy forces, reconnaissance teams either successfully disengaged or fought and defeated the enemy by using organic direct fire weapons systems or by directing close air support.

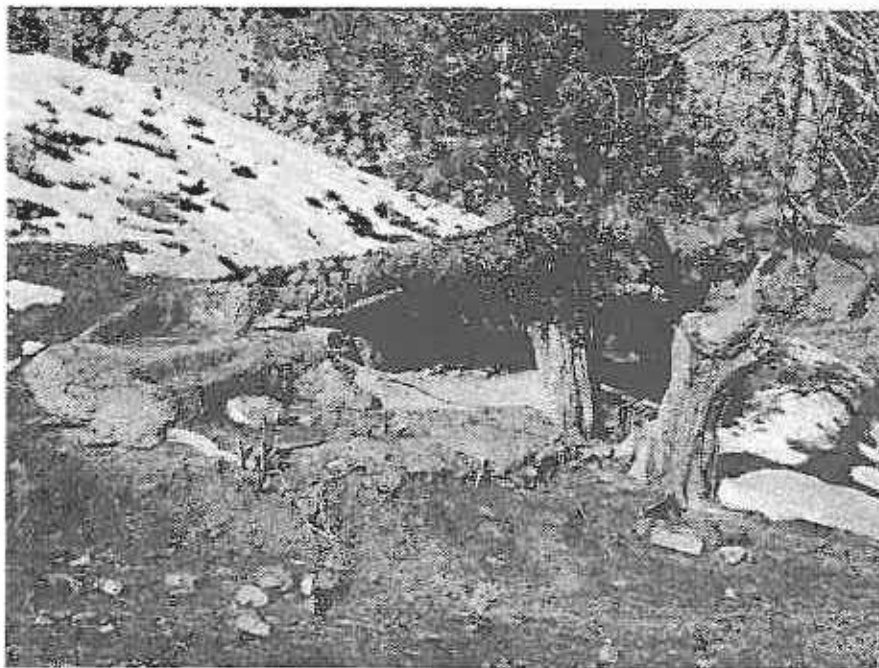


Figure 8. Enemy Bunker – Example

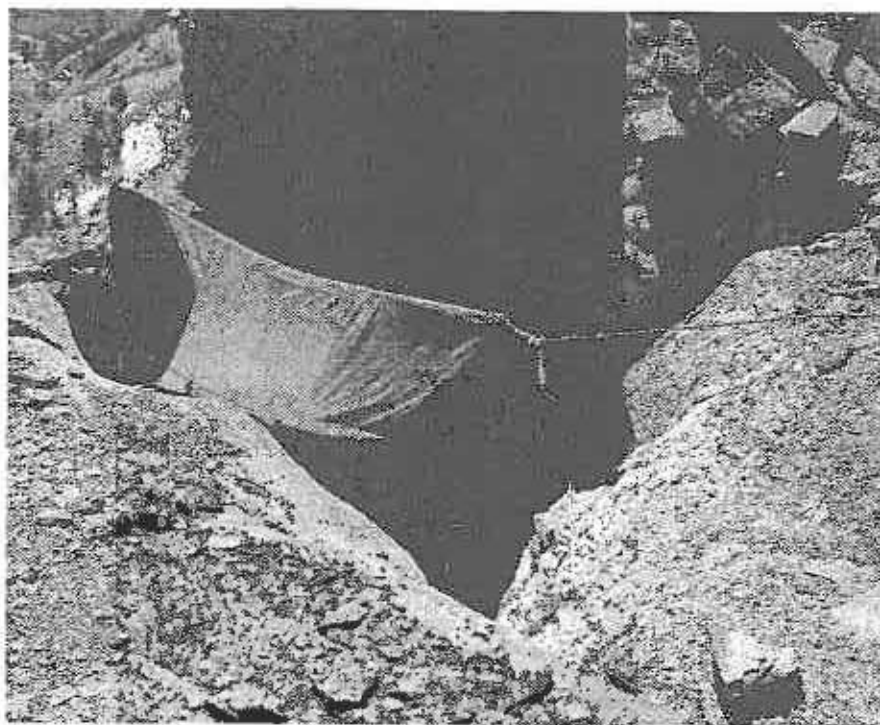


Figure 9. Enemy Command and Control Tent - Takur Ghar

Infrared (IR) Strobe-Lights.

As the U.S. seeks to skip a generation of technology in its pursuit of transformation, this section serves as a reminder that even aged technologies' inherent shortcomings are not completely understood until vetted under battlefield conditions.

After RAZOR 03's controlled crash, the SEALs did a quick head count that confirmed what they already knew — Petty Officer Roberts was missing. One of the team members activated an infrared strobe-light to mark RAZOR 03's position. Technical Sergeant (TSGT) John Chapman, the team's USAF combat controller set up his radio next to their downed helicopter and contacted GRIM 32, a nearby AC-130H. Adding to the eventual confusion, an AC-130H from a sister unit (GRIM elements) had replaced the AC-130Us (NAIL elements) — which had departed the airspace. Each evening's period of darkness was split between the two deployed AC-130 units — AC-130U (NAIL elements) and AC-130H (GRIM elements). Unfortunately for MAKO 30, the AC-130 units had changed out just as Roberts tumbled from RAZOR 03. Due to the two-plus hour delay, the GRIM elements came on duty with no knowledge of the MAKO missions. Consequently, they did not have the coordinates for Takur Ghar, nor the situational awareness that the NAIL elements had acquired. Nevertheless, TSGT Chapman passed the coordinates for Takur Ghar to GRIM 32 and asked them to look for Roberts.¹⁷

Meanwhile, Roberts was outnumbered and alone on Takur Ghar. Nobody knows for sure exactly what transpired in the minutes immediately after his fall onto the mountaintop. There were no surveillance aircraft over the mountain at the time. However, based upon the evidence accumulated during the subsequent inquiry, Roberts probably survived the short fall from the helicopter, activated his IR strobe-light, and engaged the enemy with his squad automatic weapon (SAW).¹⁸ He was mortally wounded by gunfire as the Al-Qaeda closed in, probably within ninety minutes of falling from the helicopter.¹⁹

The RAZOR 03 emergency landing location was in close proximity to friendly forces (Task Force RAKASSAN) and was also within two miles of MAKO 21's insertion point. MAKO 21, unaware of MAKO 30's plight, continued its movement to link up with an observation post in the northwest part of the Shah-e-kot valley. Unfortunately, others up the chain of command were soon to think that MAKO 30 was using an infrared strobe-light to facilitate the link up, at the very time that MAKO 30 and Roberts, signaling their distress, were activating their infrared strobe-lights.

GRIM 32 (AC-130H), after coordinating with a sister aircraft (GRIM 33) to cover the downed helicopter (RAZOR 03), departed its orbit to look for Roberts on Takur Ghar. As each command and control node learned of the incident, increasingly frantic calls cluttered the radio net with requests for information. GRIM 32 reported seeing an IR strobe-light on Takur Ghar, surrounded by eight to ten personnel. This report quickly became confused with the situation on the ground at RAZOR 03's location, where the same number of personnel gathered around *that* IR strobe-light. Others up the chain of command conjectured that the IR strobe-light was actually MAKO 21 conducting its link-up. Meanwhile, the MAKO 30 team leader, did not realize that his helicopter had flown over seven kilometers distance and 3,000 feet vertically away from Takur Ghar. He directed TSGT Chapman to transmit his intention for his team to make a quick ascent up Takur Ghar to rescue Roberts. Hearing this radio call, GRIM 32 then assumed that friendly elements were near Roberts, which made its aircrew reluctant to shoot at the enemy personnel closing in on Roberts' IR strobe-light. Within ten minutes of its sighting, the IR strobe-light on Takur Ghar disappeared.

As each of the separate headquarters attempted to sort out exactly what was happening, there was considerable confusion as to: 1) where Roberts had fallen off the helicopter, 2) where RAZOR 03 actually had set down in relation to Takur Ghar, 3) on which landing zone RAZOR 03 had attempted to insert MAKO 30, 4) what the enemy and friendly situations were near RAZOR 03, 5) what the friendly and enemy situation was in Roberts' vicinity, and 6) whether the IR strobe-light with personnel around it was at the RAZOR 03 site, at MAKO 21's linkup point, or on top of the mountain. Unquestionably, the personnel on RAZOR 03 had the best situational awareness at this point. However, possessing only a single means of communication (SATCOM radio) and with heavy traffic on the net, they could not convey their knowledge through to their headquarters to influence a more rapid rescue attempt.

IR strobe-light technology has been in use since the advent of night vision devices. The standard IR strobe-light possesses a sleeve that allows its user to make the light directional by pointing it toward its target audience – and keeps the enemy from observing it. Without the sleeve, the light is omni-directional. Over the years, U. S. forces have used the IR strobe-light for many purposes, mostly to mark friendly positions, or to facilitate nighttime link-up operations. It is unfortunate that here, during the heat of battle, with the technology working exactly as intended, the IR strobe-light technology hindered efforts more than it helped.

The more densely forested the terrain, the more restricted the effects of the light. Conversely, the more open the terrain, the less restricted its effects. The ANACONDA operational area, consisting of high desert and mountainous terrain, fits the latter category. The

fact that ANACONDA was a relatively small and sparsely vegetated area did not favor the close and simultaneous use of the basic technology of IR strobe-lights. Consequently, the lights cluttered the battlefield, sowing confusion among the players. The fact that U.S. special operations forces had not anticipated such a possibility is in itself enlightening. Although this technology had been in use in both peacetime and war, for well over twenty years, this drawback was not apparent until discovered in a combat environment.²⁰

Prior to strobe lights, tactical units often used colored smoke or star clusters (flares). Personnel in distress often used small pen flares to mark their positions. Unlike the IR strobe lights, these items are visible to the naked eye. Therefore, none of them would have been relevant for use during this battle. Without the IR strobe lights, would the outcome for Roberts have differed? It is difficult to say. Roberts' only other means of communication was his ½ watt Multi-band Inter-Team Radio (MBITR). It was not powerful enough to speak with his teammates seven kilometers away – where Razor 03 landed, and the AC-130 (GRIM 32) did not possess Roberts' frequency. The initial confusion certainly slowed rescue plans and precluded the AC-130 from firing diversionary shots on the mountaintop. Whether a diversion would have helped Roberts elude the enemy we will never know – but the possibility exists.

Transfer Of C2 – Reliance On Predator Video.

Clausewitz would probably acknowledge that technological means have changed the nature of friction and the command and control problems on the tactical level. If a dearth of information was the major cause for friction in the past, the surplus of information in the present has given rise to a new form of friction. Another modern danger is that less-important decisions will be made at higher echelons as political and military leaders attempt to centralize the management of war by removing authority from lower-level commanders on the battlefield. Field commanders will thus become agents inspecting the implementation of orders from the rear, rather than military decision-makers grappling with the dangers and uncertainties of war. Technology has changed the nature of intelligence by eliminating some problems while creating others.²¹

—Michael I. Handel, Clausewitz in the Age of Technology

Prior to the advent of Predator feeds, “seeing the battlefield” has traditionally been a metaphor for understanding a battlefield’s essence, or, more colloquially – having “total battlespace awareness.” The Task Force RECCE commander had been operating in the area for a considerable period and had developed an intuitive grasp of the area. Although he was in a vehicle with no support staff and only radio communications, he had excellent situational awareness. He was in constant radio communication with his liaison officer at Hagenback’s 10th Mountain Division and, through a SATCOM link, had immediate access to the Joint Special Operations Task Force battlestaff and enabling forces at its behest. He had the tools. At the time that Roberts fell onto Takur Ghar, the Task Force RECCE commander had better situational awareness than any of the other headquarters elements. As he recounted:

...almost immediately after I heard MAKO 30’s call, I deduced pretty good situational awareness of what had just transpired. I knew that there could not have been friendly forces [except Roberts] on top of the mountain. I had communications with all the key elements and I had line of sight to the mountaintop. The AC-130 (GRIM 32) was reporting an IR strobe-light on top of the mountain with additional personnel moving in direction of what appeared to be Roberts. I quickly formulated a plan to have the AC-130 strike some parts of the mountain to potentially give Roberts a chance to break away. I believed we could have then quickly inserted the remnants of MAKO 30 to extract Roberts.

However, this plan was thwarted because the AC-130 could not verify if there were friendlies with Roberts, and consequently, did not want to shoot...²²

The JSOTF commander nonetheless concluded that with the Predator feed, his battlestaff could "see the battlefield" better than the Task Force RECCE commander. He had subconsciously leapt from metaphor to reality, equating the Predator feed to battlefield omniscience. Consequently, early in the fight, he directed Task Force RECCE to relinquish C2 to his battlestaff. Though that staff also enjoyed ready access to theater "enabler" forces (Figure 3), the decision to transfer C2 rested *primarily* on access to Predator.²³ The battlestaff was located over a thousand miles and a time zone away in Oman. The fact that it was in Oman necessitated the use of Satellite Communications radios to provide direction to those in Afghanistan. SATCOM radios, however, are notorious for their unreliability and inability to handle high traffic loads. The JSOTF commander knew this, yet such was the attraction of Predator feeds that he discounted SATCOM's potential negative impact.

One should not necessarily criticize the JSOTF commander's decision. He had a considerable supporting cast to help facilitate that decision. But his decision to transfer control demonstrates technology's powerful allure. With the clarity of hindsight, during an after-action review, he eventually concluded that it would probably have been better for the Task Force RECCE commander to retain control of the rescue effort.²⁴ Had the Predator not been in use, there is little doubt that the TF RECCE commander would have retained control. And he would have relied on the tools at his disposal – the AC-130s, MAKO 30, his liaison officer at the 10th Mountain Division, the JSOTF battlestaff, and the Quick Reaction Force. Unquestionably, the Task Force RECCE commander grasped the situation on the ground much earlier than did the battlestaff in Oman. He was in his command vehicle within sight of Takur Ghar, and therefore in a better position to control the situation using line-of-sight radios.

Line-of-sight radios, although limited in range, are more reliable than the over-the-horizon radios, such as satellite communication and high frequency radios. Over-the-horizon radios must "bounce" their signals off either a satellite or the ionosphere. Once the JSOTF commander directed his staff to take control of the fight, its members exercised control primarily through the Satellite Communications radio net. Although working some issues telephonically, it became almost completely reliant on Satellite Communications to develop and sustain their understanding of the situation.

As the operational logs show, there were periodic episodes of confusion.²⁵ The sporadic nature of satellite radio transmissions, necessitating repeat transmissions, contributed

to this confusion. "Message relaying" became the rule, rather than the exception, for the SATCOM-dependant MH-47E helicopters, particularly since their SATCOM radios are notorious for their unreliability. The performance of those radios during the battle at Takur Ghar was no exception. At least two of the MH-47Es reported extreme SATCOM difficulties during the fight.

Line-of-site radio traffic in the vicinity of Takur Ghar was obviously unavailable to the battlestaff in Oman. This reduced or delayed their knowledge of critical battlefield events, such as requests for fire support. Conversely, the Task Force RECCE commander had this awareness. His vehicular mounted SATCOM radios were working well. Although the TF RECCE commander did not have a Predator feed in his vehicle, his liaison network pushed him critical information in real-time.

Within minutes, RAZOR 04, after inserting MAKO 21, arrived at RAZOR 03's position and picked up the downed crewmen and SEALs – taking them to Gardez. While enroute, the pilots of RAZOR 04 and the MAKO 30 team leader formulated a plan to return and rescue Roberts, despite the fact they knew a heavily armed Al-Qaeda force would be waiting. Knowing how brutally Al-Qaeda treated prisoners, Roberts' teammates and commanders knew time was running out. RAZOR 04, now with a cargo of five SEALs and TSGT Chapman, then departed Gardez to return to Takur Ghar. There were no suitable landing zones other than where RAZOR 03 had taken fire two hours previously. Everyone on the helicopter knew that time was of the essence and that inserting the rescue team at the base of the mountain, which would require a three-four hour climb, was not an option. The only real possibility was a reinsertion in the same landing zone, where RAZOR 03 had landed.

With less than two hours until sunrise, and the Predator transmitting images of Takur Ghar to the battlestaff, RAZOR 04 approached the mountain. Despite enemy fire hitting the helicopter, the six remaining members of MAKO 30 charged off the back ramp and onto Takur Ghar. The helicopter, although damaged, returned to Gardez without further incident. Once on the ground near Roberts' last known location, and using the waning darkness for cover, the team assessed the situation and moved quickly to high ground. The most prominent features on the hilltop were a large rock and tree. As they approached the tree, TSGT Chapman saw two enemy soldiers in a bunker under the tree. He and the team leader opened fire, killing both. Almost immediately, the Americans began receiving fire from a second bunker position some twenty meters away. A burst of gunfire hit Chapman, mortally wounding him. The SEALs returned fire, throwing hand grenades into the bunker positions to their immediate front. As the firefight continued, two of the SEALs were wounded by gunfire and grenade fragmentation. Finding themselves in a deadly crossfire, with Chapman probably dead and two of their

members seriously wounded, the outnumbered SEALs disengaged. As they withdrew, they left Roberts and Chapman on the mountaintop. Making matters worse, the team's long-range communications equipment was in Chapman's rucksack. The SEALs moved down the mountain to the northeast. Using his small, inter-team radio, the SEAL team leader contacted an overhead AC-130 (GRIM 32), and requested fire support. GRIM 32 responded with covering fire as the SEALs withdrew.

At approximately 0345 (2315Z), the Joint Special Operations Task Force commander alerted the ranger quick reaction force — a designated unit on standby for such situations. He did not know exactly how he was going to use the rangers, but he knew that he needed to get them closer to the action. At 0515, the quick reaction force boarded two MH-47E helicopters: RAZOR 01 and RAZOR 02. They were directed to move forward to Gardez. RAZOR 01 carried ten Rangers and three Air Force personnel (an enlisted tactical air controller (ETAC), a combat control team member (CCT) and a Pararescueman (PJ)). RAZOR 02 carried ten Rangers. When they departed Bagram, the quick reaction force had little information about what was happening on Takur Ghar. In fact, as they departed Bagram, they assumed that they were going to guard RAZOR 03, the downed helicopter.²⁶ As the quick reaction force flew toward Gardez, the embattled SEALs, withdrawing from Takur Ghar, requested immediate assistance. The Joint Special Operations Task Force approved the request and directed the quick reaction to insert their teams at an "offset" landing zone, not the same landing zone where RAZORs 03 and 04 had taken fire.

Due to intermittent SATCOM transmissions and the battlestaff's need to relay information through multiple layers, the quick reaction force helicopters either misunderstood or never received the "offset" instructions. These same communications glitches hampered attempts to provide tactical updates to the quick reaction force commander aboard RAZOR 01, as well as battlestaff attempts to determine the SEAL team's condition and location.²⁷ Consequently, RAZOR 01 and its contingent of Rangers made plans to land at the same landing zone where both RAZORs 03 and 04 had taken enemy fire. Here the Task Force RECCE commander on the scene would clearly have made a difference, if he had been in control of the operation. At the least, he would have insisted that RAZOR 01 use an offset landing zone. He would also have been in a position to give this direction personally, using the more reliable line of sight radios, which would have significantly reduced the chances of misunderstanding.

At approximately 0615, RAZOR 01 and 02 flew toward the Takur Ghar landing zone. At this point, the quick reaction force was unaware that a squad of Al-Qaeda fighters, was

anticipating their arrival. The sun was just beginning to crest in the east when RAZOR 01 approached. On final approach, a rocket propelled grenade exploded on the right engine cowling, while small arms fire peppered the helicopter from three directions. The pilots attempted to abort, but the aircraft was too severely damaged. The right side mini-gunner, SGT Phil Svitak, opened fire, but was hit in the abdomen by an AK-47 round and died almost immediately. The helicopter dropped approximately ten feet and landed hard on the snow-covered landing zone. Both pilots were seriously wounded, as they crash-landed the crippled aircraft. The helicopter nose was pointing up the hill toward the main enemy bunkers, approximately 70 meters from where TSGT Chapman had died. The impact of the crash knocked everyone on the helicopter to the floor. The Rangers, the combat controllers, the Pararescuemen, and the eight-man Chinook crew struggled under intense fire to get out of the helicopter. The rear door gunner and a Ranger opened fire out of the back of the aircraft, killing an enemy soldier. Sergeant Brad Crose and Corporal Matt Commons survived the initial landing, but were struck and killed by enemy fire as they exited the rear of the aircraft. Another Ranger, Specialist Marc Anderson, was hit and killed, while still inside the aircraft. The battlestaff watched helplessly as the Predator video streamed back to their operations center.

Despite intense small arms fire, one of the two Pararescueman, Senior Airman Jason Cunningham, and another medic remained inside the helicopter and began treating the wounded. At the same time, the surviving Rangers quickly sought cover next to the helicopter, assessed the situation, and fixed the enemy locations. The Air Force combat controller worked to get close air support. Within minutes, U.S. aircraft began to bomb and strafe enemy positions; they dropped 500lbs bombs within fifty meters of the Ranger's position. While in a far from ideal position by 0700, the Rangers were no longer in danger of being overrun. They consolidated their position and established a casualty collection point to the rear of the helicopter.²⁸

After the shootdown of RAZOR 01 on Takur Ghar, RAZOR 02 inserted the remaining quick reaction force with its force of ten Rangers and a Navy SEAL into an offset landing zone, some 800 meters east and over 2,000 feet below the mountaintop.²⁹ These Rangers began a 2½-hour trek up the hill to reinforce their Ranger comrades. Their movement demanded an enormously physical effort, conducted under sporadic mortar fire and in thin mountain air. They climbed a 45-70 degree slope, mostly covered with three feet of snow, and with each soldier weighted down with over fifty pounds of weapons, body-armor, and equipment. The Navy SEAL moved quickly to join MAKO 30, which was by now some 1,000 meters down the mountain. He brought fresh batteries for their radios and an iridium cell phone. The cell phone proved critical

in relaying extraction coordinates to the battlestaff. Due to phone problems in the Task Force SEAL operations center, MAKO 30 called their command center in Virginia and requested that it relay the information to the staffs in Oman and Bagram.³⁰

By 1030, their efforts had completely exhausted both groups of Rangers, but at least they had linked-up on the mountain crest. After the Air Force combat controller had called in a final air strike, the Rangers assaulted the enemy bunkers. Within minutes, the Rangers occupied the hilltop after killing a number of Al-Qaeda, as they swept through the positions. As the Rangers consolidated, other Al-Qaeda began firing from a small ridgeline some 400 meters to the rear of the downed helicopter. The wounded at the casualty collection point were now completely exposed to the enemy fire, as were the Pararescueman and Army medic. While the Rangers maneuvered to return fire, enemy fire struck the medic. The Americans could hear the Al-Qaeda cheering over the snapping of incoming bullets and rocket propelled grenade fire. Rangers and helicopter crewmen alike risked their lives by exposing themselves to enemy fire, as they pulled the wounded into the relative safety of nearby rocks. Once again, the combat controller called in close air support. A few well-placed bombs and effective machinegun fire extinguished the enemy. Unfortunately, this attack claimed another life. Pararescueman, Senior Airman Jason Cunningham, eventually succumbed to his wounds.

The enemy air defense and ground situation in the vicinity of Takur Ghar did not lend itself to a daylight helicopter rescue attempt. Throughout the day, observation posts on adjoining hilltops, manned by Australian and American SOF, called in airstrikes on Al-Qaeda forces attempting to reinforce their forces on Takur Ghar. At approximately 2015, four MH-47 helicopters extracted both the Rangers on Takur Ghar and the SEALs below. Two hours later, the survivors and their fallen comrades were back at Bagram.

Misinterpretation of Predator Video.

The fidelity of video feeds from the RQ-1A/B Predator is nowhere near that of cable television. Nighttime Predator surveillance imagery comes from a forward-looking infra-red (FLIR) turret mounted on the undercarriage of the unmanned aerial vehicle (UAV). FLIR images, by their nature, are distorted *before* a satellite link digitally processes them. The FLIR translates the thermal energy transmitted by infrared wavelength into data then processed into a visible light spectrum video display. Visible light depends on a light source, e.g., the sun reflecting off an object. Objects above 0 degrees Kelvin emit thermal infrared energy, so thermal imagers can passively see all such objects regardless of ambient light. But they are seeing the differential emissions of heat from those objects, not reflected light.³¹ The images captured during the battle at Takur Ghar were fed through a Ku-band satellite link to produce a continuous, secure signal video. This secure-link process further degrades the image. The Predator orbiting Takur Ghar was at 17,000 feet Mean Seal Level (MSL) – more than a mile above the 10,200' mountaintop. Although the FLIR was at its highest magnification level for most of the battle, the images left much to be desired. Consequently, one can describe the video taken of the battle at Takur Ghar as nearing only 20/200 visual acuity. Regardless, even with improved acuity, it would have been difficult to ascertain *exactly* what was transpiring below.

As stated previously, there was considerable confusion during the initial hours of the action. When Roberts fell from the helicopter, there were no Predators over Takur Ghar. In fact, the first live feed was not available until almost 1½-hours after Roberts' fall.³²

General Hagenback has suggested that he saw, on live Predator feed, Roberts immediately taken captive by three enemy personnel and executed.³³ Others, viewing the same feed, reported seeing Roberts maneuvering against the enemy, getting shot several times, and finally attacking an enemy bunker with his pistol – until fatally wounded. Almost two weeks after this event, after analyzing the Predator and AC-130 tapes numerous times, the consensus amongst those studying the tapes was that Roberts was in fact the individual maneuvering to assault the enemy positions. So, sure of this, Roberts' Deputy Commanding Officer, who spoke at Roberts' memorial service, repeated this interpretation as near certainty.³⁴

There were over 1,000 people in attendance [at Roberts' memorial service] and needless to say, it was moving. I had the opportunity to speak with several individuals, both in the [SEAL] Teams and in the Agency, who were in country at

the time of Neil's death and who had also viewed the Predator video as well as another video. The following is merely a sanitized compilation of the conversations I had and tidbits from the [Deputy Commanding Officer's] eulogy... 'Neil turns on his beacon and low-crawls to a position under fire. Neil takes the offensive, firing and maneuvering against the enemy and allegedly storms a machine-gun nest. Neil was shot several times, but continued the fight. Apparently, the Predator video shows the mortal wound and Neil falls to the ground (an hour after he fell from the helo). He had expended all of his ammo, both primary and secondary, as well as his grenades.' The video has Neil shooting with his pistol at very close ranges to the enemy. He was dead by the time the enemy arrived and dragged him off...³⁵ —Anonymous

Information gathered from the personal accounts, autopsy reports, AC-130 and Predator video, forensic evidence from Roberts' helmet and weapon, and physical evidence subsequently gathered from the mountain, indicates that the person seen maneuvering on the Predator feed was *not* Roberts.³⁶ Roberts was discovered at the location where his IR strobe-light was illuminated and when GRIM 32 saw eight-ten enemy personnel. This is the same location that, upon careful viewing of the Predator tape, one sees an individual knocked to the ground at 0427, where he lies motionless. Someone else appears to straddle this body for about two minutes, and then departs toward a nearby bunker at 0430 (0000Z). The body remains in this position throughout the ensuing events, progressively cooling (as seen with the thermal image). Ultimately, the Rangers discover Roberts in this exact location.

With this knowledge, one can interpret two other events captured on the Predator video: The first event begins at 0458 (0028Z) when RAZOR 04 and MAKO 30 returned to Takur Ghar. As described earlier, MAKO 30 assaulted the bunker complex, but was driven off the mountaintop by a determined Al-Qaeda force, leaving TSGT Chapman behind. The Predator video and personal statements match the events from 0458 (0028Z) to 0520 (0050Z). However, doubt remains whether TSGT Chapman was actually dead at this point. MAKO 30 left Chapman about twelve feet from the entrance to a bunker (bunker #1). The second event began at 0552 (0122Z), when the Predator shows an individual (individual A) begin to slowly crawl from a concealed position, where he methodically begins to flank the bunkers on the hilltop. (See figure 10)

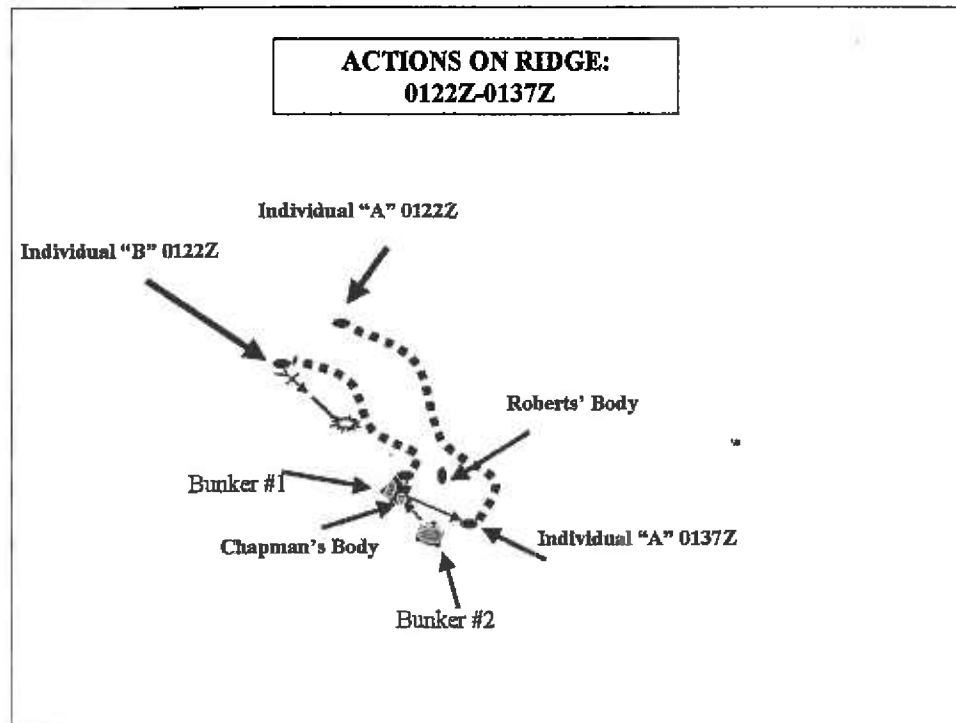


Figure 10. Actions on Takur Ghar 0122Z to 0137Z

As individual A moves, another individual (individual B) fires an RPG toward bunker #1 – in an apparent attempt to suppress the bunker. Individual A initiated a firefight at 0607 (0137Z) and appears to be killed by rifle fire from bunker #1. Task Force SEAL and 10th Mountain Division personnel watching this live Predator feed believed at the time, and subsequently, that this individual was Roberts.³⁷ After the Rangers seized the mountaintop, they found TSGT Chapman *in* bunker #1 - about twelve feet from where MAKO 30 last saw him. Individual A's body was found lying dead in the exact location where the Predator video indicates someone was killed. He was discovered to be an enemy soldier wearing desert pattern Goretex trousers – trousers taken from Roberts' rucksack. (See Figure 11).



Figure 11. Enemy Soldier (Individual "A")

The Rangers discovered Roberts' rucksack and helmet during the mountaintop fight, approximately 150 meters south of the location where they found Roberts. A bullet hole and DNA evidence found in Roberts' helmet were consistent with his autopsy report. The head wound associated with the helmet was described as "immediately fatal." The physical separation between Roberts' and his helmet demonstrates that Roberts was in fact killed before MAKO 30 returned to the mountaintop at 0458 (0028Z). Once MAKO 30 returned to the mountaintop, there were no other opportunities for the enemy to move Roberts' helmet or rucksack to the point where the Rangers discovered them. Roberts' pistol was found on him, still in its pre-mission configuration. The evidence is conclusive that Roberts was not a participant in the firefight that erupted at 0607 (0137Z).

The question then remains – what actually happened on Takur Ghar during this timeframe (0552 - 0607)? Knowing that Roberts had died prior to this point leaves two plausible scenarios. The first possibility is that this was an *enemy on enemy* engagement. It is conceivable that Al Qaeda may have re-occupied bunker #1 and unwittingly began to fire upon their own forces to the south of the bunkers – judging them to be remnants of MAKO 30. Conversely, this would have caused the enemy in the southern draw to believe that elements of MAKO 30 remained on the mountaintop. The acoustical echoing effect of mountain fighting

makes it difficult to discern the location, direction, and distance of rifle fire – which may have created uncertainty in the enemy's mind. Detracting from the plausibility of this scenario, however, is the fact that this event occurred during emerging daylight. The enemy should have had ample visual acuity to coordinate, de-conflict, and discriminate their fires. Also, US and Russian-made weapons each make a distinctive sound. Combat experienced soldiers can easily make this distinction.

A second possibility is that TSGT Chapman was not dead when the MAKO 30 team left him. It is conceivable that he may have crawled into Bunker #1 and began to single-handedly fire upon the enemy. Supporting this theory is the fact that the Rangers found Chapman in Bunker #1 – twelve feet from where the MAKO 30 team leader said he saw him get hit. How did TSGT Chapman move the twelve feet to get into the bunker? He was found under the debris in the bombed out bunker – indicating that he was in the bunker when the Ranger-directed bombs struck – not blown into it. The caution and persistence of the enemy, coupled with the emerging daylight, lends credence to this theory. Chapman's autopsy report challenges the plausibility of this theory.³⁸ TSGT Chapman received numerous wounds to both his upper and lower extremities. The wounds to his upper body were described as immediately fatal. If Chapman received these upper body wounds at 0030Z, when his MAKO 30 teammates were still with him, the pathologists say that he would not have survived more than a few minutes, and certainly not long enough to be fighting an hour later. Though he never attempted to physically confirm Chapman's death, the MAKO 30 team leader insists that Chapman was dead before they left the mountain. Notwithstanding the team leader's insistence to the contrary, if Chapman were to have initially received only lower extremity wounds, then it is within the realm of plausibility that he could have lived beyond the team's exodus from the mountain, crawled into the bunker, and continued to fight the enemy. Although there is an uninterrupted Predator video image of this timeframe, supplemented with exhaustive forensic and pathological evidence, one cannot make a definitive assessment as to which theory is more probable.

That the inquiry went to considerable lengths to determine these facts is instructive. Though investing a substantial number of man-hours to review video, process evidence, and interview participants, one cannot explain battlefield events fully that the Predator video captures. This should be a troubling tutorial for those who believe that technology has already created, or will soon create, total battlefield awareness. The consequences of this misreading of Predator video were to mislead ABH1 Roberts family and friends unintentionally during his memorial service. In the future, the consequences could be the unnecessary deaths or defeat

of friendly forces. Hellfire-armed Predators raise the stakes for the misidentification of battlefield operatives.

There are a number of lessons one can draw from the battle at Takur Ghar with respect to Predator. The three most important would appear to be:

- Real-time Predator video may influence viewers who are predisposed to see planned events. *This was certainly the case at Takur Ghar, where Roberts' colleagues desperately wanted to see him alive and taking it to the enemy. They not only saw what they wanted to see, they saw what they needed to see.* "Just as friction in war cannot be eliminated by technological advance, in part because people must employ the new machines, so 'people, being of the human condition... are necessarily enmeshed in a network of preconceptions.'" ³⁹

- Overhead Predator UAVs will not provide total battlespace awareness. *One cannot assume situational and battlefield awareness simply because Predator is overhead in the area of interest. Despite the significant depth and breadth of the inquiry of Takur Ghar, no one has yet made sense of the battlefield event between 0552 and 0607 – which the Predator fully captured. This event militates against the presumption that real-time video provides omniscience.*

Some Marines...have admonished Air Force airmen and other proponents of 'information dominance' and its putative virtues that despite admitted improvements in U.S. intelligence, surveillance, and reconnaissance capabilities since the mid-1980s, there can be no such thing as 'total battlespace awareness' because of the omnipresent fog of war and that the idea of a bloodless and antiseptic war waged with standoff weapons from fighter cockpits and remote consoles is self-delusional...⁴⁰

- *Users of Predator should be careful to keep in mind that intelligence communities, before certifying the veracity of their products, usually require two distinctively independent sources of corroboration.* The rare exception to this rule is the occasional human intelligence (HUMINT) product. Therefore, one should strive to supplement Predator video with other intelligence sources.

Conclusion.

The U.S. military is fielding some outstanding technologies to support its missions. Many of these technologies saw their first combat use during operations in Afghanistan. The preponderance of the equipment and systems worked exactly as advertised. Although during ANACONDA the latest technology helped in achieving battlefield dominance, there were instances where over-confidence in technology actually made matters worse. With the benefit of hindsight, one can recognize these instances. But why were they not apparent before combat operations? What could have been done to uncover these pitfalls earlier?

The Secretary of Defense has made military transformation his centerpiece. To many, transformation remains an elusive vision. Few understand the Secretary's vision, while more cannot agree on what it is, much less what its endstate should be. Although Mr Rumsfeld is clear that the transformation process is about more than equipment, the focus of the debate within the military-industrial complex has remained in this area. This might be the result of Mr Rumsfeld's desire to "skip a generation" of technology and use the savings to transform the military into a future force that would outclass any potential adversary. Ostensibly, the U.S. could afford to do this because of the absence of a peer-competitor – an absence that would continue until fulfillment of his vision. This could lead one to believe the administration is willing to accept security risks during the hiatus between generations of technology.

What is the best use of the time afforded by a generational leap? Maybe the focus of transformational efforts should be in the areas of joint doctrine, systems, or processes instead of technology. Taking a page from the lessons of Takur Ghar, a transformation in the process used to "red team" technology may be in order. "Red teaming" is a vulnerability assessment process. It is sometimes used to identify the critical vulnerabilities of a weapons system. Perhaps, as part of the developmental process, there should be a transformation in the way new technologies interface with joint systems. "Red teaming" an emergent technology's performance within the network centric system of systems may help to discover hidden nuances within the operational landscape. Just as the defense industries vet new combat aircraft design limitations thoroughly through a series of test flights, so too must the services and industry test other combat systems to discover *their* limitations. Unfortunately, not all combat systems lend themselves as readily to testing, as aircraft do.

Conceivably, though, the best place to accomplish the discovery process is at one of the Combat Training Centers (CTC). The Opposing Force at the CTC is the best at adapting to the latest U.S. technologies. It has displayed remarkable ingenuity in its ability to thwart some of

the most current combat systems. For example, the U.S. Air Force Joint Surveillance and Target Attack Radar System (JSTARS) provides both moving target indicator data and synthetic aperture radar images. Depending on weather and terrain, it is also able to acquire and track moving vehicles within a 10,000 sq/nm area. It provides near-real time information about the enemy's size, strength, and movement throughout an operational area. Nevertheless, OPFOR at the National Training Center (NTC) has learned how to deceive JSTARS operators and analysts, and then, through deceptions, set the stage for defeating U.S. forces. Because JSTARS cannot dependably determine the composition and type of vehicles in a column, the OPFOR regularly organizes battalion-size truck columns, led by a few armored vehicles dragging twenty to thirty ft. lengths of concertina wire. These formations, easily seen by JSTARS, then take an expected route of march toward U.S. forces. This technique deceives the opposing commander as to the true point of enemy attack. U.S. forces then array their assets against the wrong avenue of approach and create a weakness at the true point of attack. The OPFOR then exploits the weakened avenue with their main attack. Employment of this technique has set the conditions for OPFOR success a number of times.⁴¹ The OPFOR routinely use low-tech means to defeat hi-tech systems. Short of actual combat, CTCs are the best test laboratory the U.S. military possesses.

As long as adversaries continue to be thinking, reacting entities, and as long as the elimination of fog and friction remains an elusive goal, chance will inevitably affect the outcome of conflict. Although technology can reduce fog and friction, it cannot eliminate them, nor can it eliminate chance. As Clausewitz suggests: *'...the general unreliability of all information presents a specific problem in war: all action takes place, so to speak, in a kind of twilight, which, like fog or moonlight, often tends to make things seem grotesque and larger than they really are.'* When the course of a campaign takes a wrong turn, only the grit and determination of personnel and commanders can enable commanders to navigate cascading. And this is why it is imperative that U.S. forces not forget such ancient methods of warfighting as map-reading (GPS failure), basic rifle marksmanship, and fire and maneuver (to generate combat power).

The key selling points of the U.S. Army's transformation to an objective force is that it will be more readily deployable – smaller, lighter, faster, and more dispersed. Ostensibly, this future force will not require as much armored protection, because the command, control, communications, computers, intelligence, surveillance, and reconnaissance (C4ISR) capabilities will enable the force to detect and neutralize threats before they can have an impact. Yet can one assume that C4ISR will work 100 percent of the time or that commanders will interpret its

feeds correctly? When they do not, future combat systems, denuded of the latest in armored protection, may become vulnerable.⁴²

One of the results of greater dependence on ISR is to focus on transforming the use of all facets of combat power into *precision* operations. This trend is readily apparent in the area of fires. Precision fires are fast becoming the single focus in targeting. The two requirements for successfully employing precision fires are accurately locating the enemy and then the timely placing of precision munitions on him. Although this seems clear-cut, it may not prove as easy as it sounds. The fog of war, coupled with a thinking enemy's ability to elude or confound ISR efforts, may detract from the ability to target the enemy accurately. Although one may be able to deliver a precision munition where he aims, he might not always aim with a great measure of confidence.⁴³

Technology has certainly done much to reduce fog and friction, but as on Takur Ghar, it can concomitantly create a different dimension. The potential for technological over-reliance and the rule of the law of unintended (or undiscovered) consequences characterizes this different dimension. Recognizing that this dimension exists is the first step toward dealing with the real world. U.S. military capabilities already out-pace potential adversaries and allies alike, and have created an imbalance unheralded in history. Time is on the American's side. As the U.S. military looks to "skip a technological generation," it should remember that it has not fully vetted the current generation of technology. Prudence suggests that a more careful, methodical approach to developing this leap-ahead generation would represent a low-risk strategy.

As Clausewitz again reminds us, *'...we have identified danger, physical exertion, intelligence, and friction as the elements that coalesce to form the atmosphere of war, and turn it into a medium that impedes activity. Is there a lubricant that will reduce this abrasion? Only one, and a commander and his army will not always have it readily available: combat experience.'*⁴⁴ The U.S. military needs to learn an overarching lesson from Takur Ghar and leaven its zeal for rapid technological advancement with a more deliberate analysis and evaluation of new systems. Force developers should not make the soldiers discover technologies' inherent limitations the old-fashioned way, through the death of their comrades.

Although this paper has highlighted the pitfalls in over-reliance on technology, it is not an admonition against the development of future technologies. The intent has been to focus more on the process of discovering those areas where a thinking, adapting, enemy will counter the effectiveness of U.S. systems. This process has humans at its heart. Humans are a learning entity. It will be humans who direct and conduct the fighting. The Achilles heel will not so much be technology, but the expectations and predispositions humans take with them into battle

about technology and about themselves. The history of warfare possesses innumerable examples of countermeasures against every weapon system ever developed. The fog and friction of war will continue to be ubiquitous. One must understand that fog, friction, and chance dictate limitations. To survive on future battlefields, U.S. military commanders should understand war for what it is – a complex and unpredictable endeavor that requires warriors, educated and prepared to encounter uncertainty.⁴⁵ Such warriors must understand not only the capabilities of the latest technologies, but also their limitations.

Word Count – 11,938

ENDNOTES

¹ C.V. Wedgwood, William the Silent (London: Cape 1967), 35; quoted in Guenter Lewy, American in Vietnam (Oxford, England: Oxford University Press, 1978), 420.

² I am indebted to MAJ (Dr) Dave Christ, USMC, United States Special Operations Command (USSOCOM) historian and MSG Eric Nunes of the Combat Applications Group, Ft Bragg, NC, who both participated in this inquiry and were essential to the determination of critical evidence. I would also like to acknowledge my project advisor, Dr Stephen Biddle, US Army War College, Strategic Studies Institute, whose Afghan expertise and insights were key in conceptualizing the thesis, and then the production, of this project.

³ These statements and transcribed interviews are archived under "Report on Takur Ghar Mountain, 3-4 March 2002", compiled by LTC Andrew N. Milani, and stored at the office of Joint After Actions Reports Service Office (JAARSO) at Fort Bragg, NC. They are archived with other primary source documentation obtained for this project. Collectively, they comprise a compendium of the battle at Takur Ghar, cited hereafter as JAARSO. Some of the information contained in this project has been redacted for publication in this unclassified forum. For reasons of security, SOF personnel are identified by their position, rank and initial(s) only. Full identification of sources is available in the cited archival material at appropriate levels of classification.

⁴ GEN Tommy Franks, Commander, United States Central Command, comments made during 24 May 2002 press conference, Tampa, Florida.

⁵ Carl von Clausewitz, On War, ed. and trans. by Michael Howard and Peter Paret (Princeton, NJ: Princeton University Press, Princeton, 1976), p. 164-166.

⁶ Andrew N. Milani, LTC, USA, and MAJ (Dr) David Crist, USMC, "Executive Summary of the Battle of Takur Ghar", 24 May 2002, pgs 1-11. Available at <http://www.defenselink.mil/news/May2002/d20020524takurghar.pdf>.

⁷ Includes a wide array of systems, the capabilities of which remain classified.

⁸ JAARSO. vol. 1. (MAKO 30 Team Leader: SCPO S.)

⁹ Colin S. Gray, Modern Strategy, (Oxford, 1999) p. 96, quote in James R. Blaker, "Understanding the Revolution in Military Affairs: A Guide to Americas's 21st Century Defense", Progressive Policy Institute Defense Working Paper 3 (Washington, DC, 1997), 9. The title tells all in Joseph S. Nye, Jr. and William A. Owens, "America's Information Edge," *Foreign Affairs*, 75 (1996), pp. 20-36.

¹⁰ JAARSO. vol. 1. RAZOR 03 Aircraft Commander, CW4 A.

¹¹ JAARSO. vol. 1. MAKO 30 Team Leader: SCPO S.

¹² The fact that MAKO 30's HLZ had now changed did not reach the recce element's commanders – this would later slow the situational awareness by the four interested headquarters (JSOTF, TF SEAL, TF RECCE and CJTF MOUNTAIN). This point is important for context in this paper's next section with respect to the decision transferring command and control of the battle to the JSOTF battlestaff.

¹³ Gray, *Modern Strategy*, p. 52, quote in Edward N. Luttwak, *Strategy: The Logic of War and Peace* (Cambridge, MA, 1987)

¹⁴ JAARSO, vol. 1. RAZOR 03 Aircraft Commander, CW4 A.

¹⁵ Clausewitz, *On War*, p. 117.

¹⁶ JAARSO, vol. 1. MAKO 30 Team Leader: SCPO S., interview by author, 24 March 2002, Bagram, Afghanistan.

¹⁷ Andrew N. Milani, LTC, USA, and MAJ (Dr) David Crist, USMC.

¹⁸ JAARSO. See "Report on Takur Ghar Mountain, 3-4 March 2002," compiled by LTC Andrew N. Milani, specifically, vol. 1, GRIM 32 Navigator, MAJ S., telephonic interview with author, 24 March 2002, and vol. 2, Forensic DNA evidence found on Roberts' weapon.

¹⁹ JAARSO, vol. 2, Pathology report from ABH1 Roberts autopsy as written by the Armed Forces Institute of Pathology – contained in "Report on Takur Ghar Mountain, 3-4 March 2002," compiled by LTC Andrew N. Milani.

²⁰ The movie "Blackhawk Down" depicted an urban scene where the IR strobe light was used to mark the run-in position for the helicopter gunships to engage the enemy.

²¹ Michael I. Handel, *Clausewitz and Modern Strategy*, (London, 1986) pp. 68-69.

²² JAARSO vol. 1. TF RECCE Cdr, LTC P.

²³ The JSOTF Commander convened an After Action Review on 20 May 2002, where he conceded this point.

²⁴ Ibid.

²⁵ JAARSO, vol. 1. See TF SEAL and JSOTF Joint Operations Center (JOC) logs.

²⁶ JAARSO, vol. 1. QRF Commander, CPT N.

²⁷ Ibid.

²⁸ Milani, Crist, pp. 1-11.

²⁹ The battlestaff watched the Predator in horror as the RAZOR 01 was shot down on Takur Ghar. They quickly realized that more succinct instructions were required to ensure RAZOR 02 went to an offset landing zone.

³⁰ JAARSO vol. 1. TF SEAL, LCDR V.

³¹ Sierra Pacific Inc web site, "Library/Thermal IR/How IR imagers work," Undated; available from <http://www.x20.org/library/thermal/how.htm>; Internet; accessed 2 January 2003.

³² RAZOR 03's emergency landing location was filmed almost immediately by an overhead Predator. However, due to limited situational awareness at the controlling headquarters, repositioning the Predator to Takur Ghar was delayed.

³³ Reuters, "Al-Qaeda Men Dragged Away U.S. Navy SEAL," Pool report filed by a journalist traveling with U.S. forces. March 05, 2002 09:29 PM ET; available from http://ads.x10.com/foxnews/fn1_brwfl_LND126.htm; Internet; accessed 2 January 2003.

³⁴ Paul Salerni paulsalerni@earthlink.net Electronic mail forwarded to this author <mlania@aol.com> by a former SOF colleague, date and author unknown.

³⁵ Ibid.

³⁶ JAARSO, vol. 1. Forensic evidence. Forensic DNA evidence processed at the FBI laboratory indicates the probability that Roberts was firing his weapon after being wounded. Roberts' blood was found in the chamber of his M249 SAW, which is a belt fed weapon. The fact that Roberts' blood made its way into the weapon's chamber leads us to believe that he bled on the ammunition belt as he was firing.

³⁷ Note: This belief persisted for almost a month until the preliminary results of the inquiry began to take shape. These convictions were so strongly held that Roberts' Deputy Commanding Officer erroneously and unintentionally attributed these exploits to Roberts during a eulogy at Roberts' memorial service.

³⁸ JAARSO, vol. 2. AFIP autopsy report on TSGT Chapman.

³⁹ Gray, *Modern Strategy*, p. 137. Quote from Barry S. Strauss and Josiah Ober, *The Anatomy of Error: Ancient Military Disasters and Their Lessons for Modern Strategists* (New York, 1990), pp. 6-7, and Barry D. Watts, *Clausewitzian Friction and Future War*, (Washington, DC, 1996), esp. ch 8.

⁴⁰ Benjamin S. Lambeth, *Transformation of American Air Power*, (Ithaca, NY, 2000), pp. 284-285.

⁴¹ For a detailed description of how the CTC OPFOR routinely defeat U.S. high-tech systems, see: John D. Rosenberger, Colonel, USA, "The Inherent Vulnerabilities of Technology: Insights from the National Training Center's Opposing Force," Undated; available from <http://www.wargamesdirectory.com/html/articles/Various/technology.asp>; Internet; accessed 2 Jan 2003.

⁴² I am indebted to my distinguished colleagues in the US Army War College class of 2003, Advanced Strategic Arts Program, for their insights into potential objective force vulnerabilities.

⁴³ Phil Reddendorf, Lt Col, USMC, War Room Report, 2-03.

⁴⁴ Clausewitz, On War, p. 122.

⁴⁵ Reddendorf, 2-03.

GLOSSARY

ABH1. Aviation Boatswain's Mate 1st Class (Petty Officer 1st Class)

AMC. Air Mission Commander

AQ. Al Qaeda

CCT. Combat Control Team

CFLCC. Combined Forces Land Component Commander

CJTF. Combined Joint Task Force

CONUS. Continental United States

CPL. Corporal

CTC. Combat Training Center

C2. Command and Control

C4 ISR. Command, Control, Communications, Computers, Intelligence, Surveillance, and Reconnaissance

DShK. Soviet made 12.7mm Machinegun

ETAC. Enlisted Tactical Air Controller

FLIR. Forward Looking Infrared

GPS. Global Positioning System

HF. High Frequency

HLZ. Helicopter Landing Zone

HUMINT. Human Intelligence

HVT. High Value Target

IR. Infrared

ISR. Intelligence, Surveillance, and Reconnaissance

JOC. Joint Operations Center

GLOSSARY (cont)

JAARSO. Joint After Actions Reports Service Office, Fort Bragg, NC.

JSTARS. Joint Surveillance and Target Attack Radar System

JSOTF. Joint Special Operations Task Force

LZ. Landing Zone

MFD. Multi Function Display

MMR. Multi Mode Radar

MSL. Mean Sea Level

NTC. National Training Center

NVG. Night Vision Goggles

OP. Observation Post

OPFOR. Opposing Force

QRF. Quick Reaction Force

PJ. Pararescueman

Rece. Reconnaissance

RPG. Rocket Propelled Grenade

SATCOM. Satellite Communications

SAW. Squad Automatic Weapon (5.56mm)

SIGINT. Signals Intelligence

SOF. Special Operations Forces

STS. Special Tactics Squadron

TF. Task Force

UAV. Unmanned Aerial Vehicle

USSOCOM. United States Special Operations Command

USCENTCOM. United States Central Command

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30 June 2015

416 Kingsford Rd
Fayetteville, NC 28314

Commandant
US Army War College
Attn: Bohdan I. Kohutiak, MSLS Director
U.S. Army War College Library
122 Forbes Avenue
Carlisle, PA
17013-5220

Subject: Addendum to US Army War College Paper - Pitfalls in Technology: A Case Study of the Battle of Takur Ghar Mountain, Afghanistan.

Dear Mr Kohutiak,

The purpose of this letter is to request the placement of an addendum (Encl) to my US Army War College Paper.

As a result of an exhaustive review by Headquarters, Air Force Special Operations Command's Heroic Decoration Review Project (HDRP), this addendum serves to provide fidelity to previously inconclusive findings in my original paper - Pitfalls in Technology: A Case Study of the Battle of Takur Ghar Mountain, Afghanistan, published 7 April 2003.

The intent behind my original war college paper was to urge caution to current and future military generations about the pitfalls of technological dependence. The paper concomitantly served as a reconstructive analysis of events on 3-4 March 2002. It has been used exhaustively for research in other academic pursuits, and more recently, served as the basis for the review of an award for one of the event's participants.

The data for the paper was derived from a compilation of available participant statements, intelligence reports, operational graphics, Joint Operations Center (JOC) logs, video streams, photographs, forensic reports, and physical exploitation of what remained on Takur Ghar Mountain after the battle. The original data was collected at the behest of a JSOC commander request (Classified) to gather information about the battle. The commander's intent was to provide the families of the deceased a better understanding of the operation. The classified report was inconclusive on the matter of whether John Chapman was still alive when the Mako 30 withdrew down the mountain. The War College paper was equally inconclusive about this

matter. Based on information and video interpretation presented to me by HQ AFSOC's Heroic Decorations Review Project, I find it necessary to request the US Army War College Library include the attached addendum to my paper on file in your library.

Thank you in advance for your assistance in this matter. If you require further information you may contact me at: milaniandy@gmail.com.

A handwritten signature in blue ink, appearing to read 'A. Milani', with a stylized flourish at the end.

Andrew N. Milani

Colonel

U.S. Army Retired

Addendum to PITFALLS OF TECHNOLOGY: A CASE STUDY OF THE BATTLE ON TAKUR GHAR MOUNTAIN, AFGHANISTAN, 7 April 2003, by Colonel Andrew N Milani and advised by Dr Stephen D. Biddle.

*Page 29 – Addendum:

Though the Mako 30 Team Leader indicated that TSgt John Chapman died immediately after being struck by enemy fire during the team's attempt to assault Bunker #2, IR video analysis presented by Headquarters, Air Force Special Operations Command's Heroic Decoration Review Project (HDRP) in June 2015 clearly shows Chapman's body maintained an IR heat signature for over 80 minutes. The HDRP benchmarked John Chapman's IR signature to that of a known Taliban fighter killed during the initial assault on Bunker #1. A comparative analysis indicates that the IR signature of the deceased Taliban fighter's body diminished much more rapidly over an 80 minute period than did John Chapman's. This contrast lends credence to a belief that Chapman's immediately fatal wounds did not occur at the onset of the initial assault on Bunker #1. Chapman's immediately fatal wounds to his aortic valve must have come later in the fight – after Mako 30 withdrew from the mountaintop. The presence of a continuing IR Signature indicates that John Chapman was still alive.

The HDRP review of forensic data provides a better understanding of the evolution of events, as does the Office of Armed Forces Medical Examiner's 2015 review of John Chapman's pathology report from 2002. The Examiner's review of autopsy diagrams and photographs provide greater clarity of the proximity and angles of the wounds. The two fatal wounds followed a trajectory from Chapman's right sixth rib and traveled the same path to his left deltoid – separated by approximately 3 inches. This information is significant because these wounds were inflicted by 7.62 x 54 PKM projectiles. The proximity and position of the PKM was in a fixed location. From the location Chapman was last seen by his team leader, it is improbable to have been shot by the PKM (7.62 x54) – as this weapon was located directly in front of him, and behind the apex of the hilltop. Chapman's fatal wounds came from his right, and in an upward direction. The only plausible geometry for this trajectory is that Chapman was struck while in the prone position, with his arms forward and right flank exposed to the PKM. This scenario is consistent with the description of the unidentified individual assaulting the bunker as the MH-47 (Razor 01) with the Quick Reaction Force (QRF) arrived.

In March of 2002 the cause of death was certified as "Gunshot Wounds of Torso with Perforation of Aorta, Lungs, and Liver" and the manner of death was certified as "Homicide". Nine gunshot wounds and seven projectile injuries were documented. The Medical Examiner also noted indications of blunt force trauma to Chapman's head, consisting of contusions and abrasions to the bridge of his nose, lips, cheeks, and forehead. Additionally, there were blunt force injuries to the neck and extremities. The blunt force injuries to the head appear to be ante mortem – before death and the cessation of blood flow. These injuries are consistent with an

object striking the individual, or by Chapman hitting the ground as he fell wounded after initially assaulting Bunker #1. The Medical Examiner could not determine if this injury resulted in an altered consciousness, but it is reasonable for the Mako 30 team leader to perceive and conclude Chapman as deceased. The significance of the ante mortem bruising indicates the heart and lungs were functioning when these wounds were received, as it takes time for bruising to present. As Chapman's fatal wounds were immediate, his blood pressure would have dropped completely. The bruising would not be present to the degree shown in the report if his fatal wounds were received at the same time as the blunt force trauma to his head.

Finally, the video analysis presented in 2002 showed an individual in Bunker #1 engaged in a firefight. In both the classified report and war college paper, it was unsubstantiated as to whether the actions of this individual could be attributed to John Chapman. Although found within Bunker #1, approximately 12 feet from where he was last seen by his team leader, Chapman's body was assessed at the time to have potentially been moved into the bunker by the enemy, or blown into it by a bomb's concussion. This conclusion was drawn because the Mako 30 team leader insisted that Chapman was deceased prior to the team's exodus from the mountaintop – even though Chapman's body was later found under debris in the bunker. This fact was unexplainable as it indicated that Chapman's body would have been in the bunker when the bomb(s) struck. The caution of the enemy, coupled with the emerging daylight lends credence to the possibility that Chapman was alive and had crawled into the bunker to continue to fight. Chapman's initial autopsy report challenged the plausibility of this theory.

With respect to the timing of Chapman's death, the original paper's inconclusive understanding of these events should be amended. The information submitted from the Heroic Decoration Review Project provides significant additional information to support the *probability* that TSgt John Chapman was rendered unconscious by blunt force trauma to his head, leading the Mako team to believe he was dead. The additional IR signature, autopsy review, and projectile analyses provide more credibility to the battle scenario of what might actually have occurred on the top of Takur Ghar Mountain. With some of the original uncertainty removed, I can state that the *probability* now lies more in favor of Chapman surviving the original assault. The forensic evidence suggests it more *plausible* that TSgt John Chapman lived longer than previously thought, and that he likely continued to engage the enemy – until ultimately succumbing to fatal wounds.